

Application Serial No. 10/599,581
Reply to Office Action of March 18, 2008

PATENT
Docket: CU-4563

REMARKS

In the Office Action, dated March 18, 2008, the Examiner states that Claims 8-18 are pending and rejected. By the present Amendment, Applicant amends the claims.

1. Objection to Claims 8-18

Claims 8-18 are objected to because the Office Action considers that in Claim 8, lines 4-5, the recitation "the filler layer for a solar cell module is used in a solar cell module" is unclear. In line with the suggestion in the Office Action, Claim 8 has been amended. As such, Applicant respectfully requests withdrawal of the present objection.

2. Rejection of Claim 9 under 35 U.S.C. 112, second paragraph

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, because the Office Action considers that it is indefinite. Specifically, the Office Action states that if the recitation of "polyethylene for polymerization" is understood as the polyethylene involved in polymerization with ethylenic unsaturated silane compound to form the modified polyethylene, then the "polyethylene for addition" may be interpreted as an unmodified polyethylene that is added to the modified polyethylene to form a blend or something else. Applicant agrees with the Office Action that the "polyethylene for addition" may be interpreted in this manner. In light of this clarification, Applicant respectfully requests withdrawal of the rejection of Claim 9 under 35 U.S.C. 112, second paragraph.

3. Rejection of Claims 8, 12-15 and 18 under 35 U.S.C. 102(b)

Claims 8, 12-15 and 18 are rejected under 35 U.S.C. 102(b) as anticipated by Tsuzuki et al. (JP 2003-046105) for the reasons of record. Applicant respectfully disagrees with and traverses this rejection.

At the outset, Claim 8 has been amended to incorporate the features of Claim 17 therein. As such, Claim 17 has been cancelled. Applicant respectfully asserts that Tsuzuki et al. is silent with respect to the features of Claim 17, the likely reason that this claim was not cited in the Office Action as being anticipated. Since each and every feature of Claim 8 is not taught or suggested in Tsuzuki et al., Applicant respectfully asserts that this claim is not anticipated.

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Since independent Claim 8 is not anticipated by Tsuzuki et al., Applicant respectfully asserts that all claims depending therefrom are not anticipated for at least the same reasons.

Accordingly, Applicant respectfully requests withdrawal of the rejection of Claims 8, 12-15 and 18 under 35 U.S.C. 102(b).

4. Rejection of Claims 8-18 under 35 U.S.C. 102(b)

Claims 8-18 are rejected under 35 U.S.C. 102(b) as anticipated by Kitagawa (JP 2002-009309) for the reasons of record. Applicant respectfully disagrees with and traverses this rejection.

The filler layer for a solar cell module recited in Claim 8 includes a gel fraction after the production of a solar cell module becomes 30% or lower. This makes sealing within a short time possible and it also makes further treatments, such as heating, unnecessary. Moreover, the filler can easily be softened and melted by heating. Other advantages of the present invention over the prior art include the capability of recycling the solar cell element and a transparent front substrate used for the solar cell module (see page 4, line 19 – page 5, line 1).

The Office Action relies on the abstract [0014] and [0026] of Kitagawa to reject claims 8-18 but Applicant respectfully asserts that none of the portions of the reference cited by the Office Action disclose the element of a gel fraction after the production of a solar cell module.

Moreover, Kitagawa teaches that the modified ethylene unsaturated silane olefin resin compound is usually a resin which is contacted with moisture under existence of a silanol condensation catalyst, which is a resin that can make the structure of cross linkage form in the resin using a water cross-linking method. It goes on to teach that as a sealing agent sheet in this invention, although excessive cross-link formation should be avoided from perspectives, such as fusion processing nature, it is necessary to make the gel fraction 30% or less at the time of lamination, it is preferred to form the structure of cross linkage after lamination, and that it is not less than 60% as the gel fraction. (see paragraph [0020]).

In view of the above disclosure, one of ordinary skill in the art would clearly understand that a gel fraction of the modified ethylene unsaturated silane olefin resin compound sheet of Kitagawa needs to be 30% or lower prior to the production of a module, and is preferably 60% or higher after the production of a module. In fact, all

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of the examples disclosed in Kitagawa show gel fractions of 70% or higher after the production of modules (see Table 1 attached hereto)(attached hereto).

From such disclosure, the invention of Kitagawa is conditioned to have a gel fraction of at least 60% or higher after the production of a module.

Kitagawa further discloses that its resin sheet can attain a gel fraction of 60% or higher after the module production through a lamination process and without relying on a common water cross-linking method (paragraph [0021]). The lamination process is explained as a process where "a fusion-laminate is carried out at a temperature higher than a melting point of a modification olefin resin preferably by 10° C or more, for normally about 1-60 minutes, preferably about 5-30 minutes, under a pressure of normally about 20-200 kPa, preferably about 30-150 kPa (paragraph [0024])." However, considering the common technical knowledge at the time of the Kitagawa's invention, at least a silanol condensation catalyst would have been needed to attain a gel fraction of 60% or higher only by a lamination process and without a conventional water cross-linking method.

Publications which were known at the time of Kitagawa's patent application respectively disclosed the following:

Document 1 ("HANNOUSEI MONOMER NO SHINTENKAI (New Development in Reactive Monomer)", CMC Publishing CO., LTD.) (attached hereto) relates to a cross-link formation of reactive monomers. Document 1 discloses that the silicone grafted polyethylene, similar to the one used in Kitagawa, can be cross-linked by contacting it with moisture (page 222, § 3.5.1).

Document 2 ("SAISHIN SILICONE GIYUTSU (Latest Silicone Technology)", CMC Publishing CO., LTD.) (attached hereto) relates to the latest technology using silicone. Document 2 discloses that the silane cross-linking polymer, similar to the one used in Kitagawa, can be easily cross-linked by moisture (page 145, right column, line 10).

Document 3 (JP 11-261085) (attached hereto) is a patent application publication relating to a solar cell module, which belongs to the same technical field as that of Kitagawa. Document 3 discloses the followings as a crosslinking method of a polyethylene based resin: "a silane crosslinking method (meaning water crosslinking), wherein polyethylene based resin a part of which is silane modified is shaped into a sheet, and the resultant goes through lamination processing and condensed under high-humidity/temperature to crosslink; a peroxide crosslinking.

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wherein polyethylene based resin is added with peroxide and shaped into a sheet, laminated and crosslinked at high temperature by radical reaction; and a radiation-induced crosslinking, wherein the polyethylene based resin of the above-mentioned structure is formed into a sheet, goes under lamination processing, and crosslinked by irradiating with radiation (such as X-rays, gamma rays, beta rays, electron beams) (paragraph [0020]").

Further, document 4 (JP 2000-154889) (attached hereto) is a patent application publication relating to a cross-linked polyolefin pipe, which belongs to the same technical field as that of Kitagawa. Document 4 teaches a method in which "the above-mentioned modified resin is made to crosslink under existence of silanol condensation catalyst (paragraph [0022])" as a method to obtain a cross-linked polyolefin pipe using a silane modified polyolefin resin which is practically the same as the modified ethylene unsaturated silane olefin resin compound taught in Kitagawa.

Considering the teachings of the documents 1-4, it was the common technical knowledge of a skilled person in the art at the time of Kitagawa's invention that a modified ethylene unsaturated silane olefin resin compound as used in Kitagawa does not form a cross-linked structure, unless the resin being a novel resin, if no medium for cross-link formation such as water cross-linking, peroxide cross-linking (radical cross-linking), cross-link formation by silanol condensation catalyst or radiation cross-linking are actively provided to the resin. Moreover, Kitagawa states that materials commonly known as modified ethylene unsaturated silane olefin resin compounds can be used as the modified ethylene unsaturated silane olefin resin compound (see paragraph [0013]).

In view of the above, although the commonly known modified ethylene unsaturated silane olefin resin compound is used, it is essential for the resin sheets of Kitagawa to actively provide a medium for cross-link formation, such as a silanol condensation catalyst, to achieve a gel fraction of 71-84% after the lamination process from a gel fraction of 2-5 % prior to lamination process where a pressure of 85 kPa is applied for 15 or 30 minutes at 130-150°C. In other words, it is natural to consider Kitagawa as an invention preconditioned to actively use a medium for cross-link formation, such as a silanol condensation catalyst and Kitagawa does not teach an embodiment where no silanol condensation catalyst is used.

Considering all of the above, currently amended Claim 8 (practically no silanol

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condensation catalyst) is neither taught by nor obvious over Kitagawa. Therefore, currently amended Claim 8, and all dependent claims thereto, are not obvious in view of the prior art and Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. 102(b).

In light of the foregoing response, all the outstanding objections and rejections are considered overcome. Applicant respectfully submits that this application should now be in condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

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Date


Attorney for Applicant
Brian W. Hameder
c/o Ladas & Parry LLP
224 South Michigan Avenue
Chicago, Illinois 60604
(312) 427-1300
Reg. No. 45613